Chapter 7 – Recommended Strategies

Contents

7 Recommended Strategies

7.1 Overview of the Selection Process

The process for ranking and identifying preferred planning strategies is discussed in Chapter 5. Briefly, that process involves five steps:

1. Planning strategies are scored (based on cost and risk metrics) and ranked.
2. Strategic metrics are added to the ranking metrics to complete the scorecard for the top ranked strategies.
3. Selected strategies are released for public comment in the draft report and associated draft EIS.
4. Additional analysis is conducted and the strategies are refreshed and rescored. Final rankings are determined, and a short list is submitted to the TVA Board for approval of a preferred planning strategy.
5. Based on the strategy selected, an implementing portfolio (20-year resource plan) will be identified as the basis for annual capacity planning studies.

The ranking of each strategy is based on the expected values of the cost and risk metrics generated using the stochastic analysis method described in more detail in Chapter 5. The expected values are translated into a score, and the scores across all seven scenarios

are combined to produce a total strategy score. Strategies are ranked based on total score from highest to lowest, and a subset of strategies is selected for further consideration based on scores and other strategic considerations.

7.2 Scorecard Results

Scorecards are generated by translating the expected values from the modeling results into a standardized score that can be summed across the scenarios for each planning strategy. Figure 7-1 summarizes the expected values of PVRR, Short Term Rates, Average of Risk/Benefits and Average of Risk computed for the five planning strategies in each of the seven scenarios, resulting in values for the 35 portfolios:

Figure 7-1 – Ranking Metrics Worksheet

		Scenarios							
	Strategy	1	2	3	4	5	6	7	**Average**
Average of PVRR (2010 B $)	A	180	137	116	138	135	109	134	**136**
	B	173	134	114	137	133	107	133	**133**
	C	170	133	115	136	133	106	131	**132**
	D	180	141	121	145	141	110	139	**140**
	E	173	135	118	139	135	108	134	**135**
Average of S.T. Rates $/MWh (level 2011-18)	A	76.82	75.92	78.42	74.47	75.75	77.31	74.97	**76.24**
	B	78.67	76.22	76.22	75.88	77.04	74.91	75.72	**76.38**
	C	79.95	76.73	78.93	77.25	76.99	77.11	77.35	**77.76**
	D	84.61	83.31	82.78	82.19	83.50	80.44	81.80	**82.66**
	E	80.41	79.39	82.05	77.91	79.40	79.82	78.52	**79.64**
Average of Risk/Benefit	A	1.45	1.36	0.91	1.27	1.26	0.99	1.25	**1.21**
	B	1.41	1.24	0.97	1.16	1.18	1.00	1.18	**1.16**
	C	1.38	1.28	0.89	1.13	1.16	0.91	1.14	**1.13**
	D	1.40	1.22	1.00	1.21	1.17	0.96	1.18	**1.16**
	E	1.40	1.23	0.91	1.17	1.16	0.89	1.14	**1.13**
Average of Risk	A	0.25	0.22	0.09	0.19	0.18	0.13	0.17	**0.18**
	B	0.24	0.20	0.10	0.16	0.16	0.14	0.16	**0.16**
	C	0.23	0.20	0.08	0.15	0.16	0.12	0.15	**0.16**
	D	0.23	0.19	0.10	0.16	0.16	0.13	0.16	**0.16**
	E	0.24	0.19	0.08	0.17	0.16	0.11	0.15	**0.16**

Applying the procedure described in Chapter 5 for translating actual values into color-coded scores, a scorecard can be produced for each of the five planning strategies. In the figure below, planning Strategy A is used to demonstrate how scores are computed and summed to produce the total ranking score:

Figure 7-2 – Planning Strategy A – Limited Change in Current Resource Portfolio

Planning Strategy A – Limited Change in Current Resource Portfolio

	RANKING METRICS				
Scenarios	PVRR	Short-Term Rate Impact	Risk/Benefit	Risk	Ranking Metric Score
1	93.87	100.00	95.07	91.26	94.82
2	95.76	99.25	90.32	85.74	93.61
3	98.28	95.78	98.39	94.38	96.84
4	97.49	100.00	88.75	77.41	92.42
5	97.09	99.85	91.73	87.21	94.81
6	94.14	93.66	90.08	80.82	90.51
Baseline	96.74	100.00	90.59	85.43	94.15
				Total Ranking Metric Score:	657.15

Total Ranking Metric Score=Sum of Ranking Metrics Scores for all seven scenarios

Ranking Metric Score=65%*(65%*PVRR + 35%*ST Rate) + 35%*(35%*Risk/Benefit + 65%*Risk)
=65%*(65%*97.09 + 35%*99.85) + 35%*(35%*91.73 + 65%*87.21)=94.81

Scorecards for the remaining four strategies are shown in the following figures:

Figure 7-3 – Planning Strategy B – Baseline Plan Resource Portfolio

	RANKING METRICS				
Scenarios	PVRR	Short-Term Rate Impact	Risk/ Benefit	Risk	Total Plan Score
1	97.71	97.59	98.40	97.34	97.68
2	97.76	98.85	100.00	99.98	98.79
3	99.61	98.70	91.37	83.79	94.79
4	98.38	98.11	98.25	93.79	97.26
5	98.44	98.14	98.61	98.94	98.51
6	96.55	96.96	88.56	78.46	91.55
Baseline	98.01	99.01	96.50	94.26	97.20
				Total Ranking Metric Score:	**675.78**

Figure 7-4 – Planning Strategy C – Diversity Focused Resource Portfolio

	RANKING METRICS				
Scenarios	PVRR	Short-Term Rate Impact	Risk/ Benefit	Risk	Total Plan Score
1	100.00	97.48	100.00	100.00	99.43
2	99.58	100.00	96.20	96.17	98.49
3	100.00	97.13	100.00	100.00	99.35
4	100.00	97.94	100.00	100.00	99.53
5	100.00	100.00	100.00	100.00	100.00
6	98.59	96.09	98.19	93.22	96.75
Baseline	100.00	98.71	100.00	100.00	99.71
				Total Ranking Metric Score:	**693.25**

Figure 7-5 – Planning Strategy D – Nuclear Focused Resource Portfolio

	RANKING METRICS				
Scenarios	PVRR	Short-Term Rate Impact	Risk/ Benefit	Risk	Total Plan Score
1	97.40	97.54	96.41	96.81	97.18
2	97.90	98.51	99.04	98.90	98.40
3	99.41	100.00	81.31	69.12	90.43
4	97.40	97.97	90.14	92.05	95.42
5	97.86	98.47	96.57	92.60	96.64
6	100.00	100.00	89.16	78.46	93.77
Baseline	98.56	99.79	92.15	91.33	96.41
				Total Ranking Metric Score:	**668.26**

Figure 7-6 – Planning Strategy E – EEDR and Renewables Focused Resource Portfolio

	RANKING METRICS				
Scenarios	PVRR	Short-Term Rate Impact	Risk/ Benefit	Risk	Total Plan Score
1	99.43	99.21	97.82	96.78	98.58
2	100.00	99.22	99.79	100.00	99.80
3	99.15	96.03	95.91	97.73	97.72
4	99.45	99.58	95.32	89.57	96.73
5	99.83	99.50	98.87	99.47	99.56
6	99.16	95.61	100.00	100.00	98.64
Baseline	99.68	99.77	98.98	98.96	99.45
				Total Ranking Metric Score:	**690.47**

As discussed in Chapter 5, the scores assigned to each strategy (and the associated color coding) are done within a given scenario. To properly interpret the scoring for each strategy, the values for each individual ranking metric in all five strategies are compared within a particular plausible scenario.

7.3 Initial Ranking of Strategies

Detailed descriptions of strategies were introduced in Chapter 5. Figure 7-7 shows the rank order of the five planning strategies based on the total ranking metrics score (the total strategy scores range from 657–693 out of a possible 700 points).

Figure 7-7 Planning Strategy Ranking Order

Rank	Planning Strategy	Preliminary Observations
1	C – Diversity Focused Resource Portfolio	- Performs the best against PVRR and risk metrics - Near the median for short-term rates
2	E – EEDR and Renewables Focused Resource Portfolio	- Near the median for short-term rates - Performs near the best for PVRR
3	B – Baseline Plan Resource Portfolio	- Ranks near the median for PVRR, short-term rates and risk
4	D – Nuclear Focused Resource Portfolio	- Ranks below the median for PVRR, rates and risk
5	A – Limited Change in Current Resource Portfolio	- Performs the worst on PVRR and risk - Ranks the best for short-term rates in some scenarios

A key element of a "no-regrets" strategy is that a portfolio performs relatively well in all scenarios, and not just the base case scenario. Using the initial planning results, Strategy C is the top ranked planning strategy on the basis of the Total Ranking Metric Score, even though the separation between this strategy and Strategy E is not statistically significant. Strategy C represents an attempt to define a balanced approach to the resource mix and performs best in five of the seven scenarios for Total Plan Score, performs second best in another, and third in just one scenario. Based on the Ranking Metrics, this implies that Strategy C is the most robust in many possible futures. Looking at individual ranking metrics, Strategy C is the top performer for PVRR and both risk metrics. It performs reasonably well on short-term rates, but it is not the best strategy in that category.

The second best planning strategy (based on Total Ranking Metric Score) is Strategy E. As with Strategy C, this strategy represents an expanded commitment to cleaner resource options, especially EEDR and renewable energy options. The strategy performs well in all four of the ranking metrics and performs best in two of the seven scenarios for Total Plan Score. The metrics scores are sufficiently high to result in a total strategy score that is very close to Strategy C, indicating that in this initial planning phase, the combination of greater utilization of EEDR and renewable sources, when combined with a higher level of assumed fossil layups, would appear to perform almost as well as the balanced approach represented by Strategy C.

The third best planning strategy is Strategy B. This strategy represents a "business as usual" approach that does not significantly deviate from existing portfolio mixes over the long-term horizon. This strategy performs reasonably well with scores in the four ranking metrics that are in the middle of the range for each metric but does not rank number one in any of the scenarios studied. This observation, when combined with the separation in the scores between Strategy B and the strategies in the top tier, indicates that this approach should not be retained as a preferred strategy for purposes of further analyzing the IRP.

Strategy A and Strategy D are in the lower tier of the total strategy scores and do not appear to represent options that offer preferable planning approaches. These two strategies represent approaches that tend to define the boundary conditions within which the other strategy results can be placed. Strategy A is an approach that includes retention of all existing fossil capacity (with a high level of clean air capital and maintenance spending) and heavy reliance on the market. The scorecard for this strategy shows it to be the worst performer in most metrics for most scenarios, except for the short-term rate metric where it performs quite well. Strategy D is characterized by the largest level of fossil layups that necessitate the most new capacity additions, resulting in poor strategy scores across the scenarios, although this strategy does outperform Strategy A.

7.3.1 Sensitivity Cases

In addition to the initial 35 portfolios developed from the five planning strategies, TVA has also performed certain sensitivity analyses that focus on key assumptions in those strategies based on review of the scorecard results. In the draft report, this sensitivity analysis consists of four cases involving Strategy C and Strategy E (the top ranked strategies based on the results to date). The characteristics of these sensitivity cases are shown in Figure 7-8.

Figure 7-8 – Sensitivity Characteristics

Sensitivity Description	Basis for Selection
C1 – Strategy C with pumped-storage hydro removed	Test for improvement in short-term rate impacts by removing defined model input for pumped-storage hydro unit
C2 – Same as Sensitivity C1 with no capacity additions prior to 2018	Test for improvements in short-term rate impacts by defining near-term capacity additions. Modeled after Strategy A, which performs the best on rates
E1 – Strategy E with greater (7,000 MW) fossil layups (same as Strategy D)	Test to see if largest values for EEDR, renewables, and fossil layups significantly improve the PVRR and short-term rate impacts of Strategy E
E2 – Strategy E with lower (2,500 MW) renewable portfolio (same as Strategy C)	Improve PVRR and short-term rates by using the lower renewable portfolio applied in Strategy C

When these additional strategies are evaluated using the same ranking metrics applied to the original set of five planning strategies, a new rank order of strategies is established, as shown in Figure 7-9 (scores now range from 655–689):

Figure 7-9 – Rank Order of Strategies

Rank	Planning Strategy
1	C1 – Strategy C without pumped-storage hydro
2	C – Diversity Focused Resource Portfolio
3	C2 – same as C1 with no capacity additions prior to 2018
4	E – EEDR and Renewables Focused Resource Portfolio
5	E2 – Strategy E with greater fossil layups
6	E1 – Strategy E with lower renewable portfolio
7	B – Baseline Plan Resource Portfolio
8	D – Nuclear Focused Resource Portfolio
9	A – Limited Change in Current Resource Portfolio

Sensitivity C1 is a slight improvement over planning Strategy C and now has the highest-ranking metric score. Sensitivity C2 is slightly lower than strategy C. The stability of Strategy C as attributes changed represents a noteworthy attribute. Sensitivities E1 and E2 do not improve the results compared to Strategy E and will be removed from further consideration.

Based on the results of these initial sensitivities, and feedback already received from stakeholders, additional sensitivity cases will be studied following the release of the draft IRP report. Further case analysis may be suggested by public comments received on the draft IRP and associated EIS. The current listing of pending sensitivity cases is shown in Figure 7-10, on the following page. These cases will be discussed in the final IRP report.

Figure 7-10 – Summary Listing of Pending Sensitivity Cases

Sensitivity Description	Basis for Selection
Evaluate alternative fossil layup schedules in Strategy C	To test the impact of varying layup schedules are part of the evaluation of all defined model inputs
Evaluate impact of incremental or decremental levels of EEDR impacts in Strategy C	To identify the optimum level of EEDR given the other assumptions already set in this strategy
Evaluate impact of incremental or decremental levels of renewable resource additions in Strategy C	To identify the optimum level of renewables given the other assumptions already set in this strategy
Test deferral of nuclear expansion in Strategy C by postponing first year nuclear is allowed from 2018 to 2020	To evaluate the impact of nuclear addition timing on the short-term rate metric score for Strategy C
Test a gas-only expansion in Strategy C	To evaluate the impact to the ranking metrics, especially PVRR and short-term rates, for elimination of nuclear (and coal) as expansion alternatives
Evaluate impact on Strategy E if nuclear expansion is allowed earlier by advancing the first year nuclear is allowed from 2022 to 2018	To determine if the larger EEDR portfolio in this strategy would result in a deferral of nuclear expansion compared to Strategy C
Develop an additional scenario (#8) with attributes that match the most recent planning assumptions	Initial ranking metrics results need to be updated to include the latest assumptions
Evaluate an aggressive EEDR portfolio that targets 50% of the energy gap in selected scenarios beginning in 2015	To evaluate the impact on plan cost and risk for a more aggressive portfolio of EEDR programs (focused primarily on expanded EE benefits after 2015)

7.4 Other Strategic Considerations

In addition to the metrics used to establish the rank order of the planning strategies, TVA includes strategic metrics in the fully populated scorecard to help inform the final decision on a preferred planning strategy by recognizing other aspects of TVA's mission and potential environmental impacts. These strategic metrics include environmental and regional economic impact measures as discussed in Chapter 5. Note that for the economic impact measures, all of the IRP strategies were analyzed only for Scenario 1 and Scenario 6, the scenarios that were determined to define the upper and lower range of the impacts of the strategies within the scenario range.

Figure 7-11 below shows the strategic metrics for each of the five planning strategies.

Figure 7-11 – Strategic Metrics for Five Planning Strategies

Planning Strategy A

	Strategic Metrics				
	Environmental Stewardship			Economic Impact	
Scenarios	CO_2 Footprint	Water	Waste	Total Employment	Growth in Personal Income
1	○	◑	◑	0.1%	0.1%
2	○	◔	◔		
3	○	○	○		
4	○	◔	◑		
5	○	◔	◔		
6	○	○	◔	-0.4%	-0.4%
Baseline	○	◔	◑		

Planning Strategy D

	Strategic Metrics				
	Environmental Stewardship			Economic Impact	
Scenarios	CO_2 Footprint	Water	Waste	Total Employment	Growth in Personal Income
1	●	◕	●	1.2%	1.0%
2	●	◕	●		
3	●	●	●		
4	●	◕	●		
5	●	●	●		
6	◕	●	●	-0.1%	-0.2%
Baseline	●	●	●		

Planning Strategy B

	Strategic Metrics				
	Environmental Stewardship			Economic Impact	
Scenarios	CO_2 Footprint	Water	Waste	Total Employment	Growth in Personal Income
1	◔	○	○	1.0%	0.8%
2	◔	○	○		
3	◔	◔	◔		
4	◔	○	○		
5	◔	○	○		
6	◔	◔	○	-0.3%	-0.3%
Baseline	◔	○	○		

Planning Strategy E

	Strategic Metrics				
	Environmental Stewardship			Economic Impact	
Scenarios	CO_2 Footprint	Water	Waste	Total Employment	Growth in Personal Income
1	◕	●	◕	0.8%	0.6%
2	◕	●	◕		
3	◕	◕	◕		
4	◑	●	◕		
5	◕	◕	◕		
6	●	◕	◕	0.3%	0.2%
Baseline	◕	◕	◕		

Planning Strategy C

	Strategic Metrics				
	Environmental Stewardship			Economic Impact	
Scenarios	CO_2 Footprint	Water	Waste	Total Employment	Growth in Personal Income
1	◑	◔	◔	0.9%	0.6%
2	◑	◑	◑		
3	◑	◑	◑		
4	◕	◑	◔		
5	◑	◑	◑		
6	◑	◑	◑	0.2%	0.1%
Baseline	◑	◑	◔		

Legend	
●	Better
◕	↑
◑	
◔	
○	

Results of the CO_2 metric show Strategy D has the best performance (lowest emissions), followed by Strategy E, C, B and A. Each strategy shows a declining rate of emissions, and the variance between each strategy is quite low since all fossil units that remain in service will receive environmental controls. It should be remembered that all five strategies would be fully compliant with all applicable air emission regulations. Results for the other air emissions trends can be found in Appendix A. Results of the water metric show Strategy D has the best performance, followed by Strategy E, C, A and B. Additional information and calculations can be found in Appendix A.

Results of the waste metric show Strategy D has the best performance, followed by Strategy E, C, A and B. Additional information and calculations can be found in Appendix A.

Based on these preliminary results, planning Strategies D and E have the best relative performance across the environmental stewardship metrics. Strategy C is average to slightly above average, and Strategies A and B have the lowest relative performance.

For the economic impact metrics, Strategy A is the worst performer. Strategies B, C, D and E had more comparable results, within a few tenths of a percent difference from the impacts computed for the reference case (Strategy B in Scenario 7). Strategies C and E have very similar impacts, performing above the reference case in the long term under both Scenarios 1 and 6.

Along with the strategic metrics, innovations that enable the utilization of key technologies identified in the planning strategies have been identified and summarized in the figure below. Figure 7-12 identifies which of the five planning strategies would be impacted by each of the innovations.

Figure 7-12 – Technology Innovation

Technology Innovation	Description	A	B	C	D	E
Smart Grid Technologies	Advancements in this area are necessary to fully realize the EEDR benefits included in certain planning strategies.		X	X	X	X
Transmission Design & Infrastructure	Improvements in transmission system devices to manage power flows and advancement in dc line technologies will be needed to facilitate power transfers and the import of additional wind-sourced power.			X	X	X
Advanced Energy Storage	More research is needed to improve the design of pumped-storage hydro (PSH) and identify new storage technologies that might offer advantages similar PSH.			X	X	X
Small Modular Nuclear Reactors	This technology may offer some flexibility for siting and operating nuclear capacity in those strategies that include a reliance on new nuclear capacity later in the planning period.		X	X	X	X
Advanced Emission Controls for Coal-Fired Units	To enable full use of coal-fired resources, advances in emission controls (especially carbon capture and sequestration) are needed to achieve a more balanced long-term generation portfolio.	X	X	X		

TVA will closely monitor and may invest in these and other technology innovations during the planning period. The particular technology innovations that are necessary to implement the preferred planning strategy will likely shift as more information becomes available about each technology area and as power supply needs change.

Chapter 7 – Recommended Strategies

In addition to the PVRR risk metrics discussed in Chapter 5, there are other risks that should be considered when evaluating the merits of alternative strategies. The financial risk measures included in the ranking metrics portion of the planning strategy scorecard may indirectly account for some of these risks, but only in part. Examples of these broader risk considerations include:

- The ability of EEDR programs to stimulate distributor/customer participation and deliver forecasted energy savings and demand reductions: Planning strategies with higher EEDR targets will have a greater exposure to this risk.
- The availability and deliverability of natural gas: There is finite capacity in the existing natural gas infrastructure. Risks of being limited by deliverability and availability will likely increase as natural gas generation capacity is increased.
- The ability to achieve schedule targets for licensing/permitting, developing and constructing new generation capacity: Risks of meeting schedule targets will likely increase as the number and complexity of construction projects increase. In addition, projects with more extensive licensing/permitting requirements may have greater exposure to schedule risk.
- The timely build-out of transmission infrastructure to support future resources: This is a particular concern with projects that may require transmission expansion outside of the TVA system, such as power purchase agreements for wind energy. Risks will likely increase as the amount of construction required increases and if that construction is undertaken by entities other than TVA.

The list above is not intended to be exhaustive. It provides examples of other strategic components that will be considered, along with the results of analysis and public input, as TVA identifies its preferred planning strategy. TVA encourages those commenting on the IRP to provide information about and their views on these other risks.

7.5 Recommended Strategies

Based on the preliminary results, TVA plans to retain the top three ranked planning strategies for further analysis. Strategies C, E and B will be subjected to additional analysis and sensitivity testing in an effort to determine improved combinations of planning attributes. Composite strategies may also be developed by combining attributes of one or more of the strategies. A recommended planning strategy will be identified from these strategies.

This information, along with appropriate evaluations that may be proposed in public comments on the draft report, will be included in the final IRP scheduled for completion in spring 2011. The strategies and recommendations contained within the final IRP will be presented to the TVA Board for approval of a preferred planning strategy.

7.6 Implementing Portfolio

Implementing portfolios (20-year resource plan) will be identified as part of the evaluation that will be done between the release of the draft and final IRP. In this draft report, a broad set of portfolios has been identified that corresponds to the three planning strategies retained for further analysis.

Four representative resource plans were selected from planning Strategies C, E and B; the 12 implementing portfolios for the draft IRP are shown in Figure 7-13. These portfolios describe a relatively broad set of resource plan options that will be subjected to additional analysis prior to completing the final IRP. Portfolios produced in Scenario 1 represent the most new resource additions, while those produced in Scenario 3 represent the least amount of new resources that could be added over the planning period.

Figure 7-13 – Implementing Portfolios

Year	Planning Strategy C				Planning Strategy E				Planning Strategy B			
	SC 1	SC 2	SC 3	SC 7	SC 1	SC 2	SC 3	SC 7	SC 1	SC 2	SC 3	SC 7
2010	PPA's & Acq				PPA's & Acq				PPA's & Acq			
2011												
2012	JSF CC	JSF CC	JSF CC	JSF CC	JSF CC	JSF CC	JSF CC	JSF CC	JSF CC	JSF CC	JSF CC	JSF CC
2013	WBN2	WBN2	WBN2	WBN2	WBN2	WBN2	WBN2	WBN2	WBN2	WBN2	WBN2	WBN2
2014	CTa								CTa CT GL CT Ref			
2015	CT GL CT Ref CC			GL CT Ref CC	GL CT Ref CTa CC (2)			GL CT Ref CC	CT CC	GL CT Ref		GL CT Ref CTa
2016	CT				CT				CT			CT
2017									CT			CTa
2018	BLN1			BLN1	CT			CC	BLN1			BLN1
2019					CC				CT	BLN1		
2020	BLN2 PSH	PSH	PSH	BLN2 PSH	CC	PSH	PSH		BLN2			BLN2
2021	CT				CTa				CC	BLN2		
2022	CC	BLN1			BLN1	BLN1		BLN1	CT CC			CC
2023	CC				CT				CT			CT
2024	NUC	BLN2			BLN2	BLN2		BLN2	NUC			
2025	IGCC			CT	CT				IGCC	NUC		CT
2026	NUC				CT			CT	NUC			
2027	CT			CC	CT				CT	NUC		CT
2028	CT				NUC			CTa	CC			
2029	IGCC CTa	NUC		CTa	CT			CTa	IGCC CTa	CTa	CTa	CC

Defined Model Inputs	
Fossil Layups	3,252 MW by 2015
Renewable Firm Capacity	953 MW by 2029
	8,791 GWh by 2029
EEDR	4,638 MW by 2029
	14,032 GWh by 2029

Defined Model Inputs	
Fossil Layups	4,730 MW by 2015
Renewable Firm Capacity	1,157 MW by 2029
	12,251 GWh by 2029
EEDR	6,043 MW by 2029
	16,455 GWh by 2029

Defined Model Inputs	
Fossil Layups	2,415 MW by 2015
Renewable Firm Capacity	160 MW by 2029
	4,231 GWh by 2029
EEDR	2,520 MW by 2029
	7,276 GWh by 2029

Key:
PPA's & Acq = purchased power agreements, including potential acquisition of third-party-owned projects (primarily combined cycle technology)
JSF CC = the combined cycle unit to be sited at the John Sevier plant (Board approved project, currently under development)
WBN2 = Watts Bar Unit 2 (Board approved project, currently under development)
GL CT Ref = the proposed refurbishment of the existing Gleason CT units
CC = combined cycle
CT/CTa = combustion turbines
PSH = pumped-storage hydro
BLN1/BLN2 = Bellefonte Units 1 & 2
NUC = nuclear unit
IGCC = integrated gasification combined cycle (coal technology)

Key observations about these 12 portfolios include:

- The first non-Board approved new unit addition is in 2014 or 2015 in 6 of the 12 portfolios.
- EEDR avoided capacity benefit is as much as 6000 MW by the end of the planning period; renewables can provide up to an additional 1100 MW of capacity.

- New nuclear capacity is added in 9 of the 12 portfolios; the earliest in-service year for new nuclear is 2018.
- In addition to nuclear, additions are primarily combustion turbine units, with combined cycle capacity added late in the planning period or in the high growth scenarios.
- IGCC capacity is added late in the planning period in two of the high load growth scenarios.

The 35 portfolios that are produced by evaluating each planning strategy in each scenario of the IRP can be found in Appendix C. A recommendation about the implementing portfolio (or portfolios) will be made after additional analysis for the final IRP report has been completed.

7.7 Conclusion and Next Steps

TVA has renewed its vision to help lead the Tennessee Valley region and the nation toward a cleaner and more secure energy future, relying more on nuclear power and energy efficiency and relying less on coal. The publication of the draft IRP is a major milestone in the identification of TVA's long term planning approach to meet that vision. However, there are still many issues that need to be addressed prior to publication of the final IRP such as evaluation of feedback from the public comment period and other stakeholder concerns, evaluation of overall portfolio risks and execution of additional sensitivity analysis.

During the period of time between the publication of the draft IRP and the publication of the final IRP, TVA will continue to interact with stakeholder groups and the general public. In addition, analysis will continue with the goal of clearly refining multiple strategic options that TVA should consider for long-term implementation. This additional evaluation, along with stakeholder feedback, will be instrumental in identifying the recommended strategy from the short list (Strategies B, C and E), strategies resulting from sensitivities run from that list, or a composite of those strategies that balances the key aspects of TVA's mission.

The final IRP, along with the included recommended planning strategy, will be submitted to the TVA Board in Spring 2011. Using the information provided in the IRP, along with other input, the TVA Board is expected to approve a preferred long-term planning approach. This strategy will provide a recommended direction that retains the flexibility required to meet future power supply requirements and is in the best long-term interest of Valley residents.